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10/550,069	09/21/2005	Morio Tomiyama	2005_1488A	1629

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EXAMINER	
SASINOWSKI, ANDREW	

ART UNIT	PAPER NUMBER
4163	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/550,069	TOMIYAMA ET AL.	
	Examiner	Art Unit	
	ANDREW J. SASINOWSKI	4163	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 September 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 September 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *9/21/2005, 4/4/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 through 3, 7, 8 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Honguh et. al [EP 0,725,396].

3. Regarding claim 1, Honguh teaches an optical recording medium [abstract] comprising: a substrate [fig. 1c, #101] having pits on one face thereof [fig. 1c]; a reflective layer [fig. 1c, #103] formed on the face bearing the pits of the substrate in a manner so as to reflect lands and recesses of the pits [fig. 1c]; and a cover layer formed on the reflective layer [fig. 1c, #105], wherein the pit depth d, which is a difference between lands and recesses of the reflective layer, the wavelength λ of signal-reproducing laser light and the refractive index n of the cover layer satisfy the following relational expressions, $\lambda/(5n) \leq d \leq \lambda/(3n)$ and $d \neq \lambda/(4n)$ [col. 11, line 9-10].

4. Regarding claim 2, Honguh teaches an optical recording medium [abstract] comprising: a first substrate [fig. 1f, 111] having first pits on one face thereof [fig. 1f]; a first reflective layer [103] formed on the face bearing the first pits of the first substrate in a manner so as to reflect lands and recesses of the first pits [fig. 1f]; a second substrate [102] formed on the first reflective layer, with second pits being formed on a face on the side opposite to the first reflective layer [fig. 1f]; a second reflective layer [104] formed

on the face bearing the second pits of the second substrate in a manner so as to reflect lands and recesses of the second pits [fig. 1f]; and a cover layer formed on the second reflective layer [fig. 1f, 106], wherein the first pit depth d1, which is a difference between lands and recesses of the first reflective layer, the wavelength λ of signal-reproducing laser light and the refractive index n1 of the second substrate satisfy the following relational expressions, $\lambda/(5n1) < d \leq \lambda/(3n1)$ and $d \neq \lambda/(4n1)$ [col. 11, lines 9-10, note that by using the PMMA substrate as taught in col. 15, lines 11-14 would inherently match this inequality], wherein the second pit depth d2, which is a difference between lands and recesses of the second reflective layer, the wavelength λ of signal-reproducing laser light and the refractive index n2 of the cover layer satisfy the following relational expressions, $\lambda/(5n2) \leq d \leq \lambda/(3n2)$ and $d \neq \lambda/(4n2)$ [col. 11, lines 9-10].

5. Regarding claim 3, Honguh teaches the optical recording medium according to claim 2, wherein the first pits of the first substrate and the second pits of the second substrate are formed by a combination of concave-shaped pits and convex-shaped pits or a combination of convex-shaped pits and concave-shaped pits [fig. 1f].

6. Regarding claim 7, Honguh teaches an optical recording medium according to claim 2, wherein both of the first pits of the first substrate and the second pits of the second substrate are formed by a combination of concave-shaped pits or a combination of convex-shaped pits [fig. 1f].

7. Regarding claim 8, Honguh teaches an optical recording medium according to claim 7, wherein the first pit depth d1 is a difference between lands and recesses of the first reflective layer, and the second pit depth d2 is a difference between lands and

recesses of the second reflective layer, wherein the first pit depth d1 and the second pit depth d2 satisfy the following relational expressions, with respect to the refractive index n1 of the second substrate, the refractive index n2 of the cover layer and the wavelength λ of signal-reproducing laser light, $4*n1*d1 > \lambda$ and $4*n2*d2 > \lambda$ [col. 11, lines 9-10].

8. Regarding claim 10, Honguh teaches the optical recording medium according to claim 2, wherein the second substrate is formed by using ultraviolet-ray curable resin or photo-curing resin [col. 5, lines 19-22].

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 4 through 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Honguh in view of Junsaku [JP 2001-076383].

11. Regarding claim 4, Honguh teaches the optical recording medium according to claim 3.

12. However, Honguh does not teach a optical recording medium wherein the first pit depth d1 is a difference between lands and recesses of the first reflective layer, and the second pit depth d2 is a difference between lands and recesses of the second reflective layer, wherein the first pit depth d1 and the second pit depth d2 satisfy the following relational expressions, with respect to the refractive index n1 of the second substrate,

the refractive index n2 of the cover layer and the wavelength λ of signal-reproducing laser light, 4*n1*d1 < λ < 4*n2*d2.

13. Junsaku does teach a optical recording medium wherein the first pit depth d1 is a difference between lands and recesses of the first reflective layer, and the second pit depth d2 is a difference between lands and recesses of the second reflective layer, wherein the first pit depth d1 and the second pit depth d2 satisfy the following relational expressions, with respect to the refractive index n1 of the second substrate, the refractive index n2 of the cover layer and the wavelength λ of signal-reproducing laser light, 4*n1*d1 < λ < 4*n2*d2. [abstract, note that while Junsaku teaches using two different pit depths on one recording layer, it would be obvious to one with ordinary skill in the art to use a different depth on each layer]

14. It would have been obvious at the time of invention to one with ordinary skill in the art to combine the pits depths taught by Junsaku with the optical recording medium taught by Honguh because doing so would provide a predictable result, namely that the optical recording medium tracking will have greater stability.

15. Regarding claim 5, Honguh teaches an optical recording medium according to claim 3.

16. However, Honguh does not teach an optical recording medium wherein the first pit depth d1 is a difference between lands and recesses of the first reflective layer, and the second pit depth d2 is a difference between lands and recesses of the second reflective layer, wherein the first pit depth d1 and the second pit depth d2 satisfy the following relational expressions, with respect to the refractive index n1 of the second

substrate, the refractive index n2 of the cover layer and the wavelength of signal-reproducing laser light: $4*n2*d2 < \lambda < 4*n1*d1$.

17. Junsaku does teach an optical recording medium wherein the first pit depth d1 is a difference between lands and recesses of the first reflective layer, and the second pit depth d2 is a difference between lands and recesses of the second reflective layer, wherein the first pit depth d1 and the second pit depth d2 satisfy the following relational expressions, with respect to the refractive index n1 of the second substrate, the refractive index n2 of the cover layer and the wavelength of signal-reproducing laser light: $4*n2*d2 < \lambda < 4*n1*d1$ [abstract, note that while Junsaku teaches using to different pit depths on one recording layer, it would be obvious to one with ordinary skill in the art to use a different depth on each layer].

18. It would have been obvious at the time of invention to one with ordinary skill in the art to combine the pits depths taught by Junsaku with the optical recording medium taught by Honguh because doing so would provide a predictable result, namely that the optical recording medium tracking would have greater stability.

19. Regarding claim 6, Honguh teaches an optical recording medium according to claim 2.

20. However, Honguh does not teach an optical recording medium wherein the first pit depth d1 and the second pit depth d2 satisfy the following relational expression: $d2 < d1$.

21. Junsaku does teach an optical recording medium wherein the first pit depth d1 and the second pit depth d2 satisfy the following relational expression: d2 < d1 [abstract].

22. It would have been obvious at the time of invention to one with ordinary skill in the art to combine the pit depths taught by Junsaku with the optical recording medium taught by Honguh because doing so would provide a predictable result, namely that the optical recording medium tracking would have greater stability.

23. Claim 9 rejected under 35 U.S.C. 103(a) as being unpatentable over Honguh in view of Sugaya et. al. [US 5,459,712].

24. Honguh teaches an optical recording medium according to claim 7.

25. However, Honguh does not teach an optical recording medium wherein the first pit depth d1 is a difference between lands and recesses of the first reflective layer, and the second pit depth d2 is a difference between lands and recesses of the second reflective layer, wherein the first pit depth d1 and the second pit depth d2 satisfy the following relational expressions, with respect to the refractive index n1 of the second substrate, the refractive index n2 of the cover layer and the wavelength of signal-reproducing laser light: $4*n2*d2 < \lambda$ and $4*n1*d1 < \lambda$.

26. Sugaya does teach an optical recording medium wherein the first pit depth d1 is a difference between lands and recesses of the first reflective layer, and the second pit depth d2 is a difference between lands and recesses of the second reflective layer, wherein the first pit depth d1 and the second pit depth d2 satisfy the following relational expressions, with respect to the refractive index n1 of the second substrate, the

refractive index n2 of the cover layer and the wavelength of signal-reproducing laser light: $4*n2*d2 < \lambda$ and $4*n1*d1 < \lambda$ [col. 6, lines 59-63]

27. It would have been obvious at the time of invention to one with ordinary skill in the art to combine the pit depth element taught by Sugaya with the optical recording medium taught by Honguh because doing so would have a predictable result, namely that there would be a minimization in push-pull signal levels.

28. Claim 11 through 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Honguh in view of Ogata et. al. [US 5,940,364].

29. Honguh teaches an optical recording medium as claimed in claim 2.

30. However, Honguh does not teach an optical recording medium wherein at least either the first pits of the first reflective layer or the second pits of the second reflective layer include information for tracking polarity.

31. Ogata does teach an optical recording medium wherein at least either the first pits of the first reflective layer or the second pits of the second reflective layer include information for tracking polarity [col. 25, lines 36-46].

32. Regarding claims 12 and 13, Ogata also teaches an optical recording medium wherein the information for tracking polarity is recorded as winding pit rows [fig. 1a], and an optical recording medium wherein the winding of the winding pit rows is formed by frequency modulation [col. 21, lines 11-13].

33. It would have been obvious at the time of invention to one with ordinary skill in the art to combine the tracking polarity information taught by Ogata with the optical recording medium taught by Honguh because doing so would provide a predictable

result, namely that the pits would provide the optical record reader with polarity information.

34. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Honguh in view of Iida et. al. [US 5,702,792].

35. Honguh teaches optical recording medium according to claim 2, including each layer having a first pit depth dx, which is a difference between lands and recesses of the first reflective layer, the wavelength λ of signal-reproducing laser light and the refractive index n1 of the second substrate satisfy the following relational expressions $\lambda / (5nx) \leq dx \leq \lambda / (3nx)$ and $dx \neq \lambda / (4nx)$, where x is the number of the layer in the optical recording medium.

36. However, Honguh does not teach a third substrate formed on the second reflective layer in place of the cover layer, and has third pits formed on a face on the side opposite to the second reflective layer, with a refractive index of n2; a third reflective layer formed on the face bearing the third pits of the third substrate in a manner so as to reflect lands and recesses of the third pits; and a cover layer formed on the third reflective layer.

37. Iida does teach an optical record carrier with a third substrate formed on the second reflective layer in place of the cover layer (Fig. 1b), and has third pits formed on a face on the side opposite to the second reflective layer (fig. 1b), with a refractive index of n2; a third reflective layer formed on the face bearing the third pits of the third substrate in a manner so as to reflect lands and recesses of the third pits [col. 5, lines 7-14]; and a cover layer formed on the third reflective layer [fig. 1b].

38. It would have been obvious at the time of invention to one with ordinary skill in the art to combine the third pit layer taught by Iida with the optical recording medium and pit sizes taught by Honguh because doing so would provide a predictable result, namely that there would be a third layer in the optical recording medium that could be used to record data.

39. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mueller [US 6,117,284] in view of Honguh.

40. Muller teaches a manufacturing method for an optical recording medium [abstract] comprising the steps of: forming a first substrate having first pits on one face [col. 5, lines 43-44]; forming a first reflective layer on the first pits of the first substrate in a manner so as to reflect lands and recesses of the first pits [col. 5, lines 44-45]; forming a photo-curing resin on the first reflective layer [col. 5, lines 46-47]; superposing a transfer substrate having a transfer pit face as one face on the photo-curing resin [col. 5, lines 46-51]; irradiating light toward the photo-curing resin from the transfer substrate side to cure the photo-curing resin so that second pits, obtained by transferring the transfer pit face of the transfer substrate, are formed on the surface of the photo-curing resin [col. 5, lines 51-54]; forming a second reflective layer that reflects lands and recesses of the second pits [col. 5, lines 60-62]; and forming a cover layer formed on the second reflective layer [col. 5, lines 62-65, note that while this process is taught by Muller as prior art, Muller's own invention is essentially the same process with some modifications].

41. However, Muller does not teach in his method that the optical recording medium has a first pit depth d1, which is a difference between lands and recesses of the first reflective layer, the wavelength λ of signal-reproducing laser light and the refractive index n1 of the second substrate satisfy the following relational expressions $\lambda/(5n1) \leq d1 \leq \lambda/(3n1)$ and $d1 \neq \lambda/(4n1)$, wherein the second pit depth d2, which is a difference between lands and recesses of the second reflective layer, the wavelength λ of signal-reproducing laser light and the refractive index n2 of the cover layer satisfy the following relational expressions, $\lambda/(5n2) \leq d2 \leq \lambda/(3n1)$ and $d2 \neq \lambda/(4n2)$.

42. Honguh does teach that the optical recording medium has a first pit depth d1, which is a difference between lands and recesses of the first reflective layer, the wavelength λ of signal-reproducing laser light and the refractive index n1 of the second substrate satisfy the following relational expressions $\lambda/(5n1) \leq d1 \leq \lambda/(3n1)$ and $d1 \neq \lambda/(4n1)$, wherein the second pit depth d2, which is a difference between lands and recesses of the second reflective layer, the wavelength λ of signal-reproducing laser light and the refractive index n2 of the cover layer satisfy the following relational expressions, $\lambda/(5n2) \leq d2 \leq \lambda/(3n1)$ and $d2 \neq \lambda/(4n2)$. [col. 11, lines 9-10]

43. It would have been obvious at the time of invention to one with ordinary skill in the art to combine the pit sizes taught by Honguh with the method taught by Muller because doing so would provide a predictable result, namely that the pits sizes would cause optimum reflection from the laser scanning light from the optical record reader.

Conclusion

44. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Nagasawa et. al. [US 5,848,050] teaches an optical disk having information recording tracks where grooves are wobbled in a radial direction on the track so as to represent rotation information.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANDREW J. SASINOWSKI whose telephone number is (571)270-5883. The examiner can normally be reached on Monday to Friday, 7:30 to 5:00, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Robinson can be reached on (571)272-2319. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AJS

/Mark A. Robinson/
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